

What is claimed is:

1. A heat dissipation device for dissipating heat produced by:
 - at least one electronic component of an electronic control device, which electronic control device comprises;
 - a circuit board having the at least one electronic component mounted thereon;
 - and
 - a protective case made of resin and defining an interior environment; and
 - an actuator block made of metal and mounted outside of the protective case; and
 - wherein the protective case substantially confines the circuit board within the interior environment; and
 - wherein a heat conduction path is arranged and constructed to conduct the heat generated by the electronic component from the interior environment formed by the protective case to the actuator block.
2. A heat dissipation device as in claim 1, wherein:
 - the heat conduction path includes a first heat conductive member and a second heat conductive member,
 - wherein the first heat conductive member is disposed within the interior environment of the protective case, so that the heat of the electronic component is conducted to the first heat conductive member, and
 - wherein the second heat conductive member extends from the interior environment to communicate with the environment outside of the protective case and has a first end contacting the first heat conductive member and a second end contacting the actuator block.
3. A heat dissipating device as in claim 2, wherein at least one of the first and second heat conductive members are made of metal having good thermal heat conductivity properties.

4. A heat dissipation device as in claim 3, wherein the second heat conductive member comprises at least one bolt that is adapted to fix the actuator block in position relative to the protective case.
5. A heat dissipation device as in claim 4, wherein the first heat conductive member includes a sleeve arranged and constructed to receive the bolt and extending from the interior of the protective case toward the actuator block.
6. A heat dissipation device as in claim 5, wherein the sleeve of the first heat conductive member has one end contacting the actuator block.
7. A heat dissipating device as in claim 6, wherein at least one of the first and second heat conductive members are made of aluminum alloy.
8. A heat dissipating device as in claim 3, wherein at least one of the first and second heat conductive members are made of aluminum alloy.
9. A heat dissipating device as in claim 3, wherein the protective case includes a tubular extension that extends from the protective case toward the actuator block, and the tubular extension is arranged and constructed to receive a bolt.
10. A heat dissipating device as in claim 9, wherein the tubular extension is arranged and constructed to receive the bolt together with the sleeve of the first heat conductive member.
11. A heat dissipating device as in claim 3, further including an electrical insulation member disposed between the electronic component and the first heat conductive member.
12. A heat dissipating device as in claim 3, wherein the first heat conductive member is joined to the protective case by an insert molding process.
13. A heat dissipation device for dissipating heat produced by:

at least one electronic component of an electronic control device, which electronic control device comprises;

a circuit board having the at least one electronic component mounted thereon;

and

a protective case made of resin and defining an interior environment; and

an actuator block made of metal and mounted outside of the protective case; and

wherein the protective case substantially confines the circuit board within the interior environment; and

a heat conduction path includes a first heat conductive member and a second heat conductive member; and

wherein the first heat conductive member is disposed within the interior environment of the protective case, so that the heat of the electronic component is conducted to the first heat conductive member; and

wherein the second heat conductive member extends from the interior environment to communicate with the environment outside of the protective case and has a first end contacting the first heat conductive member and a second end contacting the actuator block; and

wherein both of the first and second heat conductive members are made of metal having good thermal heat conductivity properties; and

wherein an electrical insulation member is disposed between the electronic component and the first heat conductive member.

14. A heat dissipation device as in claim 13, wherein the second heat conductive member comprises at least one bolt that is adapted to fix the actuator block in position relative to the protective case.

15. A heat dissipation device as in claim 14, wherein the first heat conductive member includes a sleeve arranged and constructed to receive the bolt and extending from the interior of the protective case toward the actuator block.

16. A heat dissipation device as in claim 15, wherein the sleeve of the first heat conductive member has one end contacting the actuator block.

17. An electronic control device comprising;
at least one heat generating electronic component; and
a circuit board having at least one electronic component mounted thereon; and
a protective case made of resin and defining an interior environment; and
an actuator block made of metal and mounted outside of the protective case; wherein
the protective case substantially confines the circuit board within the interior environment; and
a heat dissipating device comprising a heat conduction path, wherein the heat
conduction path includes a first heat conductive member and a second heat conductive
member; and
wherein the first heat conductive member is disposed within the interior environment
of the protective case, so that the heat of the electronic component is conducted to the first heat
conductive member; and
wherein the second heat conductive member extends from the interior environment to
communicate with the environment outside of the protective case and has a first end contacting
the first heat conductive member and a second end contacting the actuator block; and
wherein at least one of the first and second heat conductive members are made of metal
having good thermal heat conductivity properties.
18. An electronic control device as in claim 17, wherein the second heat conductive
member comprises at least one bolt that is adapted to fix the actuator block in position relative
to the protective case.
19. An electronic control device as in claim 18, wherein the first heat conductive member
includes a sleeve arranged and constructed to receive the bolt and extending from the interior of
the protective case toward the actuator block.
20. An electronic control device as in claim 19, wherein the sleeve of the first heat
conductive member has one end contacting the actuator block.